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other, he perceived the one or the other smell, but that when both were in exact equilibrium, either no odor at all was perceived, or at most a very weak and uncertain impression was made, which partook of the qualities of neither of the two substances employed.

But as some sort of union of the gaseous molecules could not be altogether excluded by this method, such as an indifferent osmotic or physical combination preventing sensory perception, it was deemed expedient to make use of a double olfactometer in experiments of this character. The instrument consists merely of two of the olfactometers described above, one for each nostril. By the use of the double olfactometer one may easily convince himself that even in this procedure one odor will overwhelm another, rubber, for instance, causing the smells of paraffin, wax, and tolu to disappear. Even with very strong excitants there is never a mingling of sensations. Either the one or the other odor is distinguished by one or the other nostril, until, by careful equilibration of the two, no sensory effect is at all perceived. Sensibility is absolutely eliminated. Each nasal half becomes in this manner completely insensible to the odor inhaled through it, although its sensitiveness is really the same as before.

We are constrained to believe that there is something in the vibratory theory already applied to sight and hearing, to account for these remarkable facts in the domain of smell, and that is the interference of molecular waves with each other, producing in the former cases darkness and silence, and in the latter temporary anosmia.

NEUTRALIZATION OF THE BACILLUS OF TETANUS.—In June last Professor Sormani of Milan announced to the Lombard Institute of Sciences the results of his experiments on the neutralization of the tetanigenous microbe — results which seemed to justify his conclusion that iodoform, iodol, and corrosive sublimate are absolutely destructive to the bacillus in question. To these disinfecting agents he has, says the *Lancet*, as the result of further experiments, added three more — namely, chloroform, chloral hydrate, and camphorated chloral, the latter being, he alleges, in a marked degree efficacious; while camphor and camphorated alcohol he found inert. On a general review of the whole, however, he gives the preference to iodoform. Seven rabbits were inoculated with materials charged with the tetanigenous virus. From six of these, after an interval of twelve hours, the foreign body was removed during the period of incubation; from the seventh the substance was removed only when the first symptoms of local tetanic convulsions had declared themselves. In all these animals the wound was scraped and thereafter freely medicated with iodoform. The seventh rabbit died of tetanus. Of the first six five were saved. From this Dr. Sormani concludes that medication of wounds with iodoform ought to be practised before the setting in of the first tetanic symptoms. Nevertheless, even during declared tetanus, the application of iodoform to the wound is capable of disinfecting it and of removing from it all trace of virulence. Wounds and sores treated with iodoform, especially wounds or sores contaminated with earth, yield results highly welcome to the surgeon — such medication preventing the access of that fatal tetanic symptom which, having once declared itself, leaves but little chance for skilled interference. Dr. Sormani gave confirmatory proof of his thesis by cases of tetanus in hospital, where iodoform opportunely applied saved the patients, and where, from its use having been unfortunately suspended, two lives were sacrificed.

BOXING THE EARS AND ITS RESULTS.—We would fain hope that, in deference to repeated warnings from various quarters, the injurious practice of boxing the ears, once common in schools, is fast and surely becoming obsolete. It is too much to say that this desirable end has yet been realized. Certainly the recent observations of Mr. W. H. R. Stewart do not give color to any such view. In a pamphlet on "Boxing the Ears and its Results," lately published, and referred to in the *Lancet*, Dec. 21, 1889, he briefly summarizes his own experience in the matter. Notwithstanding the toughness of the aural drum-head, its tense expanse will rupture too readily under the sudden impact of air driven inward along the meatus, as it is in the act of cuffing; and Mr. Stewart shows that in one instance at least this injury resulted from a very slight though sudden blow. Given early and skilled attention the

wound may heal very kindly, but if the beginning of mischief be overlooked, as it often has been, further signs of inflammation soon follow, and a deaf and suppurating tympanum is the usual result. There is practical wisdom in the statement that this consequence most readily follows in the case of the poorly developed and underfed children who abound in every board school. In them an ear-ache would probably receive no very strict attention, and disease might for a time work havoc unimpeded. Where chronic suppuration exists already, and it is only too common, a random knock on the ear may, and has resulted, in fatal brain complications. The close connection between ear and brain should never be forgotten, and the reflection that injury to the former organ most easily terminates in total deafness, and in suppuration which may any day take a fatal course, should assist in the preservation of a sometimes difficult patience.

BOOK-REVIEWS.

First Lessons in Political Economy. By FRANCIS A. WALKER. New York, Holt. 12°.

PRESIDENT WALKER in this work has undertaken to bring economic science down to the comprehension of a younger class of students than have hitherto pursued the subject, those from fifteen to seventeen years of age. To accomplish this task is not easy, and the author himself expresses some misgiving as to the success of his undertaking; for he has not treated his theme in a childish, or so-called popular, way, but in a thoroughly scientific manner and with the same closeness of reasoning that is employed in larger treatises. How far his book is adapted to its purpose — only actual trial, as he says, can tell; but if the subject can be made comprehensible to such young pupils, we should think this work well fitted to do so. It is perhaps as simple in style as a treatise on economics can be, and it is in the main free from controversial matter. It contains, however, some things that might better have been omitted; such, for instance, as the discussion of the multiple standard of deferred payments, which is of no practical importance, and is out of place in an elementary work.

The book is divided into two parts, the first treating of production and exchange, the second of distribution and consumption, and the various subdivisions are in general well made. President Walker's views are so well known that we need not state them, and in most cases we find ourselves in accord with them. His theory of profits, however, we cannot agree with, and we fail to see the cogency of the reasoning by which he endeavors to support it. He holds that "prices are determined by the productive capability of the lowest class of employers who are actually producing for the supply of the market; and all excess of those prices, over the cost of production in the hands of the more capable men of business, goes to these latter, individually as profits" (p. 222). But it seems to us that prices are determined rather by the higher class of employers, who by superior ability or larger command of capital often force prices down so that the lower class of employers are driven out of business. Moreover, President Walker, like other economists, overlooks the fact that the highest profits, as a rule, are not made in production at all, but in exchange. But though we cannot agree with all the author's views, we shall be glad if his work should be successful in teaching economics in the high schools.

AMONG THE PUBLISHERS.

THE fourth volume of M. Grandeau's "*Etudes Agronomiques*," just issued, contains a review of British and American agriculture, as represented at the Paris Exhibition.

— M. Victor Giraud, the African explorer, has just published the narrative of his explorations in the African Lake Region from 1883 to 1889. The work contains many illustrations.

— The fifth part of the second volume of the *Internationales Archiv für Ethnographie* has been issued. It maintains in all respects the high level reached by previous numbers. Among the contributions are an article in German, by F. Grabowsky, on death,

burial, and the funeral festival among the Dajaks; and one in English, by Prof. H. H. Giglioli, on a singular obsidian scraper used at present by some of the Galla tribes in southern Shoa.

— Mr. Charles Hallock, the founder of American journalism on field and water sports, and one of the most eminent writers on outdoor life, is now permanently associated in the editorial conduct of *The American Angler*.

— Harper & Brothers have just published Stanley's letters, telling the story of Emin's rescue, accompanied by illustrations and a map showing the traveller's route from the Kongo to the coast. Sir William Mackinnon, chairman of the Emin Pasha Relief Committee, adds some interesting material to the volume. It is of course understood that this book will not in any way trench upon Mr. Stanley's great work, which cannot possibly be published for several months.

— The J. B. Lippincott Company publish this week "A Conversation on Mines Between Father and Son," a lecture on the atmosphere and explosive gases by William Hopton, to which are added questions and answers to assist candidates to obtain certificates for the management of collieries; and "A Text-Book of Assaying," by J. J. and C. C. Beringer, for the use of students, mine managers, etc.

— D. Lothrop Company publish this week a little volume addressed to all workers with hand and brain, entitled "The Shop," devoted to the possibilities and probabilities of social, home, church, and political reform, by Albert E. Winship, editor of the *Journal of Education*.

— The second report of the committee appointed by the British Association to inquire into, and report upon, the present methods of teaching chemistry, which was presented at the Newcastle meeting, and to which attention was called in *Nature* a short time ago, has now been put on sale by the Council. It may be obtained from the office of the Association, 22 Albemarle Street, London, W.

— A new fortnightly scientific periodical is about to be published in Paris. It will be entitled *Revue Générale des Sciences Pures et Appliquées*, and will deal with the mathematical, physical, and natural sciences, and with their applications in geodesy, navigation, engineering, manufactures, agriculture, hygiene, medicine, and surgery. According to the preliminary statement, the new periodical will take as its model the method of exposition adopted in *Nature*. The editor is M. Louis Olivier, and the list of contributors includes many of the most eminent French men of science. The first number will appear on January 15, 1890.

— In the article which Herbert Ward will contribute to the February *Scribner's*, on "Life Among the Congo Savages," there will be an account of the human sacrifices which take place on the death of an African chief. Mr. Ward's article is to be a description of the manners and customs which prevail in that region which Stanley has opened to commerce. Colonel W. C. Church, in his first article on John Ericsson, in the same number, relates that, as the last hour in the life of the great engineer was drawing to its close, he called to his bedside his faithful friend and secretary, and, looking into his face with a smile, said: "Taylor, this rest is magnificent; more beautiful than words can tell." William Henry Bishop, the American novelist, tells in the February *Scribner's* of a recent visit to Galdós, the author of "Doña Perfecta," in his Madrid home. "He came into the room with a hard-at-work air and a cigarette between thumb and finger. He is a dark, slender man, of good height, rather loose-jointed, forty-four years old, and with a young look." Galdós, it is said, has had himself elected to the Chamber of Deputies in order to have a chance to study legislative manners at first hand for literary material. W. H. Mallock, author of "Is Life Worth Living?" who has written for the number an article on Hungarian castles — the fruit of a recent visit to that country — says: "Hungary still remains a very interesting study; and though it may at first disappoint those who expect to find in it castles and peasants like the back scene of an opera, it retains enough of the substance, if not of the surface, of the past to throw a considerable light on what has really been achieved, in the

way of changing or bettering the conditions of life generally, by that extraordinary movement which we especially associate with the present."

— The article which is likely to attract most attention in the January number of the *New England Magazine* is that on "The New England Meeting-House and the Wren Church," by Mr. A. R. Willard. Mr. Willard shows how Sir Christopher Wren, who was rebuilding the sixty or seventy London churches, after the Great Fire in 1666, just as our New England fathers were getting able to build meeting-houses with towers and steeples, set his stamp upon our entire church architecture, in city and country, almost from that time to this. The article is illustrated with pictures of Wren's steeples and of our own old meeting-houses. The other illustrated articles are on Montreal in Winter, and the Boston Musical Composers. Professor Jameson of Brown University, in a paper entitled "Did the Fathers Vote?" shows, in a way that is gratifying to those who believe in progress, that however neglectful we are of our political duties, we are in this respect ahead of our fathers in the "good old times" that the croakers talk about. Mr. William F. Dana writes about the Behring Sea Controversy. Mrs. Nina Moore Tiffany begins a series of "Stories of the Fugitive Slaves," telling here of the escape of William and Ellen Craft. Edward Everett Hale, in his "Tarry at Home Travel," talks this month about the Boston Parks and about Concord. Edward Everett Hale, jr., contributes a chapter of colonial history, under the head of "Edward Bendall and the 'Mary Rose.'" "Candlelight in Colonial Times" is another bit of New England history. Browning receives notice in two articles, one by Mr. Robert Niven of London, on "Browning's Obscurity," the other by Miss H. E. Hersey, on "Browning in America," the latter accompanied by a portrait from a recent London photograph. There is an "Old South Lecture" on "Thomas Jefferson and the Louisiana Purchase," by one of the young Old South essayists, Robert Morss Lovett, now a student in Harvard College.

LETTERS TO THE EDITOR.

* * * Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

The editor will be glad to publish any queries consonant with the character of the journal.

On request, twenty copies of the number containing his communication will be furnished free to any correspondent.

A New Telephone Invention.

WE see by a late number of the *New York Electrical World* that two Canadian gentlemen have made the important discovery that telephone trunk lines may be duplexed the same as telegraph wires. This has hitherto been considered impossible on account of the great dissimilarity between telegraph and telephone currents. It is on this account chiefly that long-distance telephony is more expensive than telegraphy, as only two persons can use the same wires at the same time. By means of the new invention it is claimed that four persons can use the same wires simultaneously and without the least interference. Advantage is taken of the double wire system now in general use on inter-urban trunk lines. Transmitters and receivers are used with double coils, and the apparatus is connected with both branches of the double-wire trunk line. One set of transmitters generates electrical impulses in the two wires in opposite directions, while the other set generates impulses in the two wires in the same direction. By means of these reversing coils one set of apparatus will actuate and be actuated by a set similarly connected, while, on the other hand, it will not affect nor be affected by apparatus with coils dissimilarly connected. In the one case the electrical impulses move only in the metallic circuit formed by the two wires of the trunk line. In the other case the circuit is completed through the subscriber's ground wires. If this invention is found to work as satisfactorily in actual practice as it is claimed to work experimentally, it will necessarily very materially reduce the working expense of long-distance telephone lines.

R.

Toronto, Ont., Jan. 9.